

### **ABSTRACT**

A method is disclosed for performing GC separations using a separation protocol including at least one negative temperature ramp, where the negative temperature ramp is controlled either by the introduction of a gaseous coolant at a controlled and adjustable rate or by the introduction of the coolant along with the application of microwave radiation to a column capable of absorbing microwave radiation, where the rate of coolant introduction or the rate of coolant introduction and radiation introduction is sufficient to achieve a desired rate of cooling.